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AUTHOR Kirsch, Irwin S.; Jungeblut, Ann
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ABSTRACT

This report explores background data collected as part of recent large-scale literacy surveys because these data may contribute to an understanding of the variables associated with demonstrated proficiency. The first section reviews various approaches to large-scale assessments of literacy. This review sets the context for exploring variation in literacy performance as revealed in three databases established using the profile approach. These data derive from the Department of Labor Workplace Literacy Assessment and state assessments conducted by Mississippi and Oregon. Analyses using these databases are presented that identify and evaluate demographic and background characteristics associated with literacy proficiency in diverse populations. The evidence provided indicates that measured literacy skills can be predicted relatively well for large heterogeneous populations by using a small set of background variables that are likely to be readily available from census-type information. Estimates from census-like variables are likely to be less useful with homogeneous populations or when subgroup performance is of interest. The final section discusses further considerations--cost-information trade-offs and the use of direct measures in indicator systems for less well-defined and measured entities such as the ability to participate fully in an increasingly technological society. Appendixes include a workplace literacy background and activity questionnaire, a scheme for the coding of background and attitude variables used in regression analyses, 2 data tables, and 1 figure. Contains 28 references. (YLB)

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NATIONAL CENTER ON ADULT LITERACY

USING LARGE-SCALE ASSESSMENT RESULTS TO IDENTIFY AND EVALUATE GENERALIZABLE INDICATORS OF LITERACY

Irwin S. Kirsch
Ann Jungeblut
Educational Testing Service

NCAL TECHNICAL REPORT TR94-19
JANUARY 1995

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UNIVERSITY OF PENNSYLVANIA
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TEL: (215) 898-2100 FAX: (215) 898-9804

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NATIONAL CENTER ON ADULT LITERACY, UNIVERSITY OF PENNSYLVANIA, 3910 CHESTNUT STREET, PHILADELPHIA, PA 19104-3111

NATIONAL CENTER ON ADULT LITERACY
UNIVERSITY OF PENNSYLVANIA
3910 CHESTNUT STREET
PHILADELPHIA, PA 19104-3111
PHONE (215) 898-2100 FAX (215) 898-9804

The National Center on Adult Literacy (NCAL) was established in 1990 by the U.S. Department of Education, with co-funding from the Departments of Labor and Health and Human Services. The mission of NCAL addresses three primary challenges: (a) to enhance the knowledge base about adult literacy; (b) to improve the quality of research and development in the field; and (c) to ensure a strong, two-way relationship between research and practice. Through applied research and development and dissemination of the results to researchers, policymakers, and practitioners, NCAL seeks to improve the quality of adult literacy programs and services on a nationwide basis. NCAL serves as a major operating unit of the Literacy Research Center at the University of Pennsylvania.

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USING LARGE-SCALE ASSESSMENT RESULTS TO IDENTIFY AND EVALUATE GENERALIZABLE INDICATORS OF LITERACY

Irwin S. Kirsch
Ann Jungeblut
Educational Testing Service

Abstract

Data from recent large-scale literacy surveys are used to enhance understanding of the relationships between various background variables and demonstrated literacy proficiency. Identification of important background variables provides an initial step toward developing a system of indicators that could be used in establishing national and international literacy goals as well as in measuring progress toward meeting such goals over time. The evidence presented indicates that measured literacy skills can be predicted relatively well for large heterogeneous populations by using a small set of background variables that are likely to be readily available from census-type information. Estimates from census-type variables are likely to be less useful with homogeneous populations or when subgroup performance is of interest. Further considerations—that is, cost-information trade-offs and the use of direct measures in indicator systems for less well defined and measured entities such as the ability to participate fully in an increasingly technological society—are discussed and caveats presented.

INTRODUCTION

Few, if any, deny the important role literacy plays in our lives or the advantages afforded those who have acquired and demonstrate high levels of proficiency. However, identifying and measuring the skills needed to function adequately in a technological society have proven to be difficult tasks. Although a number of reports written in the last decade have served to focus increased attention on literacy, researchers in the United States are just beginning to establish national databases from which to inform policymakers and others about the types and levels of literacy skills demonstrated by adults and how these skills are distributed across major subgroups of interest.

Since 1984, the Educational Testing Service (ETS) has conducted three large-scale adult literacy assessments. The initial study surveyed the literacy skills of 21- to 25-year-olds across the United States. The second focused on the demonstrated skills of individuals served by selected programs of the U.S. Department of Labor (DOL)—men and women seeking training and/or employment, or unemployment insurance. The latest study was designed to provide information on the total adult population of the United States, 16 years of age and older. Although the data for this survey have been collected and an initial report has been released, it was not possible to include this particular data set in the analyses conducted for the present report.

Although it is most desirable to obtain measures of literacy directly, in certain instances the resources—time, funding, and technical expertise—may not be available to develop and conduct such assessments. In instances where demonstrated proficiencies are desirable but impractical to obtain, the question arises as to whether a set of demographic and background variables can be identified that have stability and generalizability across diverse populations. The relative strengths of associations with demonstrated proficiency can help to establish an efficient set of indicators that can be used to predict literacy in lieu of direct assessment.

The purpose of this report is to explore background data collected as part of recent large-scale literacy surveys because these data may contribute to our understanding of the variables associated with demonstrated proficiency. The first section of the report reviews various approaches to large-scale assessments of literacy. This review sets the context for identifying several databases using the same framework and assessment approach for measuring adult literacy. Analyses using these databases are presented that identify and evaluate demographic and background characteristics associated with literacy proficiency in diverse populations. Finally, some considerations are presented concerning the use of proxy variables.

MEASURING LITERACY IN LARGE-SCALE ASSESSMENTS

To gauge early literacy rates in the United States, historians have had to rely upon such indicators as counts of signatures taken from legal documents like wills, marriage licenses, and deeds. It was not until the mid-1800s that the U.S. Census Bureau began gathering information on self-reported literacy rates. The Bureau counted as illiterate those individuals who reported that they could not read or write a simple message in English or any other language (Kaestle, Damon-Moore, Stedman, Tinsley, & Trollinger, 1991).

By about 1920, however, three factors set the stage for a shift away from reliance on self-reported statistics toward standardized measures of reading/literacy based on demonstrated performance. First, the widespread failure of Army recruits on World War I classification tests led to a questioning of the validity of self-reported data such as those collected by the Census Bureau. Second, reading specialists and policymakers soon began to talk about large numbers of people in the United States who could read in a technical sense but who neither read very well nor read very much (Buswell, 1937; Gray, 1933). Third, there was a growing excitement about the potential of standardized testing for educational purposes. In addition to selecting and sorting individuals, educational measurement was promoted as a means of diagnosing specific learner strengths and deficiencies, of describing particular learner achievements, and of measuring program outcomes (Buros, 1977). These factors combined to focus attention on what will be discussed as the *traditional approach* to assessing literacy.

THE TRADITIONAL APPROACH

Growing concern over the inadequacy of self-reported literacy rates, coupled with growing optimism about educational measurement, marked the point in U.S. history when *functional literacy* began to be equated with the attainment of a particular grade-level score on standardized objective tests of reading achievement. Through the use of such tests, it was possible to estimate percentages of various population groups performing at or above specified reading grade levels. This led to attempts to establish a criterion for literacy based on grade-level scores on school-based reading tests. Persons scoring at or above a specified level were considered to have adequate reading skills to perform successfully on materials or tasks judged to be of comparable grade-level difficulty. Those persons who failed to attain the specified level were labeled *illiterate* or *functionally illiterate* and were presumed to lack the necessary reading skills to function in society.

The use of grade-level test scores as an indicator of literacy problems among adults has some serious limitations. Grade-level scores are typically determined from the average performance of an in-school norming sample on multiple-choice questions covering a particular set of school-related reading passages. The literacy materials that adults generally encounter in various everyday contexts, however, are different from the materials typically associated with school-based standardized tests. As a result, performance on school-based tests is often not a good predictor of performance on literacy

tasks associated with nonschool settings (Heath, 1980; Jacob, 1982; Kirsch & Guthrie, 1984; Mikulecky, 1982; Sticht, 1978; Venezky, 1982).

Another limitation of grade-level scores in the adult literacy context is that they represent the average performance of students functioning within a particular school setting and, thus, reflect much more than simple reading achievement. Interpretation of adult performance on such a scale should be quite different from that of a school-aged child. Just as a 4th-grader scoring at an 11th-grade level on a test of reading achievement is performing very differently from a 10th- or 11th-grader performing at this level, an adult scoring at the 8th-grade level is very different from a 7th- or 8th-grader demonstrating this level of achievement.

An additional consideration is that questions are typically selected for inclusion in a standardized test on the basis of item statistics designed to yield scores that maximally differentiate between individuals. Such a procedure can result in reliable and valid tests for purposes of ranking and selection, but, particularly with adults, it is less useful for purposes of instructional placement, diagnosis of specific strengths and weaknesses, or the certification of specific competencies (Cross & Paris, 1987; Haertel, 1985). This limitation in part reflects the fact that analyses are rarely, if ever, undertaken to determine specific factors contributing to task difficulty. Nonetheless, the purposes identified above are the very ones for which standardized reading achievement tests have been employed in literacy programs for adults. Concerns such as these led researchers in the 1970s to move to what is called here the *competency-based approach* to the assessment of adult literacy.

THE COMPETENCY-BASED APPROACH

During the 1970s, national performance surveys in the United States, such as those conducted by Louis Harris and Associates (1971), ETS (Murphy, 1973), and the National Assessment of Educational Progress (1972, 1976), attempted to go beyond school-related reading tasks by including a range of materials more like those that adults typically encounter at home, at work, or in their communities. The most publicized of these national surveys was the Adult Performance Level project (Northcutt, 1975). In addition to reading and writing skills, this project included measures of computation, problem-solving, and interpersonal skills. The results were reported on performance measures as they interacted with content areas such as occupational knowledge, consumer economics, health, and law.

Although the competency-based approach to assessing adult literacy represents a significant advance over the traditional school-based measures of reading achievement, it has some of the same limitations and assumptions. With this approach, no attempt was made to analyze the tasks with respect to the cognitive processes required for successful responses or to determine what factors contributed to task difficulty. Yet the lack of efforts to determine how the interactions between particular types of questions and various materials affect processing demands limits our understanding of the range of knowledge and skills measured by a given instrument. Without such information, one cannot assume that the different assessment instruments used to evaluate program effectiveness, to measure learner competencies, or to develop instructional programs are, in fact, focusing on the same aspect of literacy (Kirsch & Mosenthal, 1993; Mosenthal & Kirsch, 1989).

In addition, with the exception of the Adult Functional Reading Survey (Murphy, 1973), which reported results solely in terms of the percentages of adults who responded correctly to each task, these surveys employed the ubiquitous additive scoring model, summing across items to yield a single score. Thus, as with earlier standardized tests, these surveys treated literacy as an ability distributed along a single continuum. Because the single point selected to represent the standard of literacy varied from survey to survey, the estimates of illiteracy or functional illiteracy ranged from about 13% to about 50% (Fisher, 1978; Kirsch & Guthrie, 1978). While debate ensued as to the accuracy of the estimates of the extent of the literacy problem and the utility of a single cut point, critics pointed to the varying definitions of literacy that had been adopted, the different standards selected, and the differences between the tasks included in the surveys as explanations for the noncomparability of results. An attempt to address these criticisms formed the basis for what is described next as the *profile approach*.

THE PROFILE APPROACH

In 1984, the National Assessment of Educational Progress, under a grant to ETS, developed and conducted a household survey of the literacy skills of young adults, aged 21 to 25 (Kirsch & Jungeblut, 1986). The initial step in conducting this assessment was to consider the adoption of an operational definition of literacy that would become the basis for setting assessment objectives and the blueprint for developing tasks to simulate the use of printed materials across adult contexts. Consensus was reached by an external committee of researchers, practitioners, and policymakers to adopt the following definition of literacy: using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.

In constructing this definition, the committee chose to reject an arbitrary standard such as signing one's name, completing five years of school, or scoring at a particular grade level on a school-based measure of reading achievement. No longer can we rely on distinctions based on the simplistic notion that literates and illiterates can be neatly pigeonholed on the basis of a single cut point on a single scale. As a result, this consensus definition goes beyond simply decoding and comprehending texts to include a broad range of information-processing skills that adults use in accomplishing the range of tasks associated with work, home, and community contexts. These tasks included (a) reading and interpreting prose, as in newspaper articles, magazines, and books; (b) identifying and using information located in documents such as forms, tables, charts, and indexes; and (c) applying arithmetic operations to information contained in printed material such as menus, checkbooks, or advertisements.

The implementation of these three literacy scales (prose, document, and quantitative) makes explicit an organizing framework for capturing in a useful way the diversity of tasks that have previously been reported on a single conglomerate scale, such as a reading grade-level score, or on the basis of performance on single items, such as identifying the percentage of respondents who gave the main idea in a news article correctly or who accurately used a benefits table to determine eligibility for sick leave.

The committee also endorsed the notion that, while literacy is not a single skill suited to all types of texts, neither does it comprise an infinite number of skills each associated with a given type of text or document. Rather, through statistical and conceptual analyses, evidence was gathered revealing an ordered set of information-processing skills and strategies that are called into play to accomplish the diverse range of tasks represented by the three aspects of literacy characterized here—prose, document, and quantitative.

In addition to the direct measurement of literacy proficiency, substantial time was also devoted to obtaining background and personal information in the following areas: demographics, education, labor market experiences, and personal and household income, as well as activities related to literacy practices and citizenship. Through the use of these background data, it is possible to gain an understanding of the ways in which personal characteristics are associated with demonstrated performance on each of the three literacy scales.

Since the release of the results from the Young Adult Literacy Survey, this profile approach to assessing literacy has been applied to other large-scale assessments: the U.S. Department of Labor (DOL) Workplace Literacy Assessment and the National Adult Literacy Survey (Campbell, Kirsch, & Kolstad, 1992; Kirsch & Jungeblut, 1992). In addition, Mississippi and Oregon each conducted their own state representative survey using the identical item pool and background questionnaire included in the DOL assessment (Cosby, Howell, Carr, & Miller, 1991; Oregon Progress Board, 1991).

Other literacy studies that looked at adult literacy from a multidimensional perspective have been conducted outside the United States: the Survey of Literacy Skills Used in Daily Activities conducted in Canada in 1989 (Statistics Canada, 1991) and the Survey of Australian Adult Literacy (Weikert, 1989). The purpose of the Canadian study was to provide a direct assessment of the functional literacy skills of Canada's adult population, aged 16 to 64, in each official language. The results were reported on three scales: reading, numeracy, and writing. In contrast to the ETS survey of young adults, the Canadian study did not separate reading prose from reading documents; the reading scale included items that used both documents and prose passages as stimuli, with a heavy emphasis on documents. For the Canadian study, literacy was defined more in terms of the ability to process document-type materials than to read and comprehend narrative or exposition. The Australian study sought to collect data on the state of adult literacy in order to inform debate about the educational programs that are necessary to meet the technological and economic developments in Australia. This study also reported results on three scales—prose, document, and quantitative—which were essentially modeled after the Young Adult Literacy Survey scales.

EXPLORING VARIATION IN PERFORMANCE

We in the United States have seen a growing concern at the state, national, and even international level about the status and quality of adult literacy skills as they relate to full participation in an increasingly technological and global

community. This section of the report explores variation in literacy performance as revealed in the three databases established using the profile approach. These data derive from the DOL Workplace Literacy Assessment and the two state assessments conducted by Mississippi and Oregon.

Each of these assessments was completed in 1990 using interviewers trained to administer individual background and cognitive survey instruments. Some 5,800 interviews were conducted with adults participating in two major DOL programs—approximately 2,500 interviews were conducted with eligible applicants to the Job Training Partnership Act (JTPA) program and approximately 3,300 interviews were completed with participants in the Employment Service/Unemployment Insurance (ES/UI) programs. In addition, 2,000 respondents from each of the two states participated in household interviews using the identical survey instruments.

The interviews consisted of some 200 open-ended simulation tasks reproduced from written materials commonly encountered by adults at home, at work, and in their communities. Each interviewee responded over a period of about one hour to approximately 40 literacy tasks, each consisting of a question or directive asked about some printed material. An additional half hour was devoted to completing a background questionnaire. Based on initial analyses, 30 background questions were identified for inclusion in the regression analyses presented in this report.

For discussion purposes, these variables were classified as part of six general areas demonstrated to be important to literacy performance in the ETS surveys: demographics, education and home support, economy and labor market, literacy practices and activities, citizenship, and self-evaluation and attitude. The specific variables are shown in Figure 1 (Appendix C) and described in the final report to the DOL (Kirsch & Jungeblut, 1992). A copy of the questionnaire is provided at the end of this report (Appendix A).

While most of the variables are self-explanatory (the coding scheme is included in Appendix B), a few need further elaboration. Under demographics, *ethnicity 1* and *2* refer to a contrast coding set up to distinguish between White, Black, and Hispanic racial/ethnic backgrounds. *Ethnicity 1* contrasts White and Black adults, while *ethnicity 2* contrasts Black and Hispanic respondents. *Years in USA* summarizes information for all individuals in the four samples and not just for those who reported being born outside the United States. Hence, for the majority of interviewees, who were native-born respondents, this variable reflects age at the time the survey was conducted. The *materials in home* variable in the area of education and home support summarizes the number of a selected set of literacy materials that were available to the respondent in the home during the high school years. In the area of practice and activities, *overall newspaper reading* summarizes across the specific sections reported separately as *practices 1* through *4* (see Figure 1, Appendix C).

Identifying Salient and Generalizable Predictors

For each of the three literacy scales, the set of demographic variables was entered first into the regression analyses as a block because they represent characteristics of an individual that are more or less unalterable. The remaining variables were then entered singly to estimate their maximum

potential contribution to predicting literacy proficiencies. In order to distinguish the relative salience of the variables, we have chosen to report the standardized regression weights across the literacy scales and the four population groups (Table 1). The replicability of these comparisons across scales and population groups provides information about the stability and generalizability of these variables as predictors of literacy proficiency.

The discussion of the standardized regression weights shown in Table 1 will focus on those variables in which the weights reach both statistical and practical significance—that is, reach a .05 or higher level of significance and have a regression weight of .10 or greater. A standardized regression weight of this size is interpreted to mean that, for every standard deviation change in the independent variable, there is a corresponding change of at least 10% of a standard deviation in the dependent variable, a change generally accepted to be of practical significance.

Within the block of demographic variables, the strongest predictors of literacy performance are *ethnicity 1* and level of *parental education*. *Ethnicity 1* reflects the mean performance difference between White and Black populations. The one notable exception is found in the Oregon data. This may well be because the state of Oregon has an extremely small Black population, and hence there is little variation to be explained. While *parental education* level receives a smaller weight, it is salient across each of the four population groups. There is a good deal of variation across scales within the four samples in the contribution of the variable *years in USA* except for the state of Mississippi. For Mississippi, the regression weights are all negative and high—within the range of -.26 to -.35. The fact that older individuals in Mississippi tend to have lower demonstrated literacy skills may not be too surprising given a large Black population containing high levels of poverty and the legacy of many years of segregated public schooling. Thus, the variable *years in USA* in this case most likely reflects chronological age and is an indicator of limited access to both education and economic opportunities.

Each of the three variables in the education and home support area yields evidence of stability and generalizability across the four populations. As would be expected, the strongest relationship across each of the three scales is shown between respondent's education level and demonstrated literacy skills. Similarly, the individual economy and labor market variables are salient across both scales and populations. One exception is seen in the JTPA population where poverty status appears to be inconsequential. This is understandable, however, when one considers that poverty status is an eligibility criterion for participation in the JTPA program. The other exception is found for the ES/UI population, where *hours worked per year* is not a salient variable. Again, this is understandable in the context of a population that is defined primarily by the reception of unemployment insurance payments.

Similar to the results for the education and home support and economy and labor market variables, those in the areas of citizenship and self-evaluation and attitude also provide evidence for stability and generalizability across scales and populations. The one exception will be found in the self-evaluations of the adequacy of reading, writing, and math skills for the respondents' current or most recent job. Here in the Oregon data, these variables reach statistical but not necessarily practical significance. As an aside, it is interesting that although small percentages indicate that their skills are inadequate for their jobs, those

who report inadequate skills demonstrate, on average, substantially lower literacy proficiencies.

The variables in the literacy practices and activities area exhibit less consistency across the populations, although several variables are stable and generalizable across scales and populations. The two most salient variables within this area are *overall newspaper reading* and *practice 1*, which involves the reading of news, editorial, and financial articles. The reported frequency of reading, writing, and mathematics for work shows less stability across scales and less generalizability across populations. This is also true for reported hours spent watching television.

Evaluating the Set of Demographic and Background Variables

To this point, the report has identified a set of background variables that have stability and generalizability across the three North American literacy databases. These analyses provide evidence for the effectiveness of information within the broad areas of citizenship, labor force participation, education and home support, attitudes, and practices in understanding the differential literacy performance of adults.

Given these results, a question arises as to how this information could be used. Some interest has been expressed in estimating literacy levels in countries or other geographical areas in which resources such as funding, time, or technical expertise are not available to assess literacy proficiency directly. Can variables demonstrating stability and generalizability, such as those identified in the three North American databases, be used as proxy variables for this purpose?

In instances where demonstrated proficiencies are desired but impractical to obtain, the question arises as to which of the salient variables identified here might we expect to be available from census-type data and how much of an association do these variables as a group have with demonstrated performance? Our sense is that information on gender, race/ethnicity, age, educational attainment, occupation, and household income is readily attainable from existing data sources in many countries.

The first row of data presented in Table 2 (Appendix C) shows the multiple correlations obtained when the six census-type variables are entered as a block in regression analyses. These do relatively well in predicting demonstrated proficiency scores in each literacy domain for JTPA, ES/UI, and Oregon populations, with the multiple correlations ranging from about .50 to .64. These variables are even more strongly associated with literacy proficiency scores demonstrated in Mississippi, ranging from .72 to .77. It is possible that the effects of limited educational and economic opportunities for large identifiable segments of the adult population in Mississippi account for the increased salience of census-type data in this state.

The question then becomes, can the multiple correlations be increased by entering additional salient background and attitude variables into the regression models? To address this question, the six census-type variables were entered into the model as a block and stepwise regressions were calculated to allow each of the remaining 24 variables to enter the model based on its relative contribution to R^2. Variables were allowed to enter the

prediction model so long as the last variable entering received a significant regression weight.

The data in the second row of Table 2 show the maximum multiple correlations for the remaining 24 variables across scales within each of the populations. The specific variables entering the model for each population are somewhat idiosyncratic. That is, in the JTPA population, some of the salient variables include *hourly wage*, *high school curriculum*, *improved reading/writing skills*, *poverty status*, and *overall newspaper reading*. In contrast, in the ES/UI population, although *hourly wage* and *high school curriculum* are salient, other contributing variables are *voting*, *parental education*, and self-perceived *adequacy of math skills for a job*.

The maximum multiple correlations using the idiosyncratic set of variables for JTPA and ES/UI populations center around .70. Those for Oregon are somewhat lower (around .60) while those for Mississippi are somewhat higher (around .75). It is perhaps more interesting to note that the idiosyncratic set of variables add more to the predictive models for JTPA and ES/UI than for the two state populations. That is, the increase in the multiple correlation is about 10 points for JTPA and about 6 points for ES/UI. In contrast, the increase in multiple correlation for Oregon and Mississippi over the census-type variables is only .02 to .03 points. It is beyond the scope of this report and probably the data sets to attempt to systematically address the reasons for these observed differences.

The increase in the multiple correlations across the four populations results from idiosyncratic sets of variables that do not fit the notion of a single model of proxy variables that could be used to maximize the predictability of literacy proficiency in a particular geographical location or for a particular population. In order to fit a general proxy model, we selected from among the 12 sets of idiosyncratic variables (three scales times four populations) only those that met the following two criteria: to be retained, a variable had to be significant for two of the three scales within a population, and it had to be significant for three of the four populations. Applying these criteria resulted in the selection of four variables that could be added to the six census-type indicators. These are *hourly wage*, *high school curriculum*, *practice 1* (the reading of news, editorial, and financial information), and *improved reading/writing skills leads to a better job*. It is worth noting that the only major area of background information not represented by these four additional variables is that of citizenship.

Regression analyses were then run with the final selected set of 10 variables entered as a block; the resulting multiple correlations are shown in the third row of Table 2. In general, at least 50% of the increase in the multiple correlations between rows 1 and 2 of the table can be attributed to this common set of 10 variables. The relationships not accounted for by this small set of 10 common variables require the inclusion of unique or idiosyncratic variables for each scale and each population.

The evidence presented indicates that one can expect to predict measured literacy skills relatively well for large heterogeneous populations using a small set of variables that are probably readily available from census-type information. The lower multiple correlations found for the two selected DOL populations suggest that estimates using census-type variables are likely to be

less useful in situations where there may be more homogeneity among the populations or subgroups of interest.

FURTHER CONSIDERATIONS

This report has examined background and literacy proficiency measures obtained from four large-scale surveys of adult populations in the United States. Its purpose is to explore the possibility of identifying a common set of proxy variables for estimating demonstrated literacy skills. This final section of the report addresses further considerations: cost-information trade-offs, uses of measures from direct assessments in an indicator system, and lessons to be learned for an international indicator system.

COST-INFORMATION TRADE-OFFS

The potential cost savings in estimating overall literacy levels based on proxy information is obvious when compared with the expense of designing, conducting, and analyzing large-scale assessments requiring trained interviewers administering a one-and-one-half-hour face-to-face survey. However, in terms of literacy, the resulting estimate will be precise enough only to estimate the relative size of the problem, should one exist for the total population. The use of proxy measures to indicate overall literacy provides little or no information about the nature of the problem.

Without a direct assessment, one does not know about the kinds or levels of literacy skills that various subgroups have acquired. For example, educational attainment receives the largest standardized regression weight across the four populations (Table 1). As would be expected given this strong relationship, the overwhelming majority of JTPA and ES/UI populations who report zero to eight years of schooling or some high school education score within the two lowest of five identified levels of document literacy. However, the DOL data also indicate that 43% and 47% of high school graduates and general educational development (GED) certificate holders in the JTPA and ES/UI populations, respectively, score in the two lowest of five defined levels of document literacy.

In all likelihood, this finding concerning high school graduates and GED certificate holders would be masked if proxy measures were used. This could result in the continuation of less efficient policy for adult learners. Within the United States, adult education is often targeted at those persons out of school who have not attained either a high school diploma or a GED certificate. These data clearly indicate that such a policy misses a significant number of individuals who report meeting this criterion. Thus, proxy data help to identify whether a problem exists but lack the precision needed to inform policy decisions adequately.

In some instances, it may be that this limited amount of information will be important and useful. For example, after the Civil War in the United States, the focus in America was on tracking crude literacy rates among the emancipated Black Americans and among the growing number of European immigrants. At that point in our history, the Industrial Revolution was well

under way and compulsory schooling was becoming a major concern. It made sense to focus on estimating the number of illiterates because there were large numbers of individuals who had not reached even the most simple criteria. By the 1920s, census data indicated that illiteracy was extremely low. However, although most Americans could read in a technical sense, indications were that large percentages could not read very well. Today, the information-processing requirements associated with the broad range of materials and purposes people have for using printed information require that we shift our focus. We are moving away from determining numbers of people and toward recognizing the various types and levels of literacy characteristic of our society. This helps to understand the complexity of demographic and background factors that interact to affect the acquisition of these proficiencies.

Uses of Measures From Direct Assessments in an Indicator System

This report describes a process whereby a set of proxy variables were selected empirically and used as general indicators of overall literacy proficiency. An indicator system using proxy variables in this way assumes an outcome such as literacy that is relatively well defined and measured. Another type of indicator system assumes a more general outcome such as overall status or health of some entity that is not so well defined or well predicted from a single or small set of measures. For example, there is increased interest in knowing about the status or health of the educational establishment in the United States, or about the ability of the adult population to participate fully in an increasingly technological society. An indicator system for such a complex entity would include individual measures or indicators judged to be important or vital to the overall enterprise. The utility of any indicator system rests on its ability to show what happens over time, in relation to other populations, and as a result of intervention. The implication is that indicators should be placed within the system so that the relationships between them can be examined and understood.

Moreover, to the extent possible, the indicators should include direct measures of important variables. For example, given the agreed importance of literacy skills for everyday life, an indicator system to assess participation in society would capitalize both on direct measures of various aspects of literacy proficiency and on the understanding of interactions between these measures and background and attitude variables gained from experimental work. In fact, it has been argued that many business leaders and elected officials believe that the most important indicators, at both the national and the international level, are those that allow comparisons about cognitive skills and knowledge about specific topics.

Lessons for an International Indicator System

The data from the four large-scale assessments discussed in this report seem to provide some clear caveats for the development of an indicator system. When the entity of interest can be assessed directly, it is possible to identify empirically a set of proxy variables that will predict the entity reasonably well. In fact, in each of the four populations examined for this report, a set of six census-type variables produced multiple correlations of at least .50. However, the prediction appears to be best for the two heterogeneous state samples examined—the multiple correlations obtained with the census-type variables

was within .02 or .03 points of the maximum multiple correlation obtained through the use of idiosyncratic sets of background and attitude variables. For the two more selective samples, the difference between predictions for the six census-type variables and the maximum correlations range from about .06 to .10. This is a notable difference given the overall size of the multiple correlations. Nevertheless, it is noteworthy that an additional common set of four background and attitude variables was identified that accounts for roughly 50% of these differences across the three literacy scales and four populations.

The use of proxy variables that rely on questionnaire responses raises another question, one of the reliability of self-report data. All of the background and attitude data collected as part of these large-scale surveys were obtained by trained interviewers conducting face-to-face interviews. Whether individuals taking these surveys would respond in the same way to identical questions received in the mail or asked over the telephone is open to debate.

So is the question of what happens to such a system of indicators when the nature of the responses is associated with financial rewards or sanctions. Under such circumstances, the pressure to produce desired outcomes can become enormous. Many people are concerned that self-report data are subject to corruptibility. Direct assessments can be similarly affected if people are allowed to eliminate individuals, from either the sample or the analyses, who are expected to perform poorly.

It should be emphasized that the development of a proxy model using the procedures outlined in this report rests on the ability to develop and conduct direct assessments. Without these measures there would be no evidence for the differential validity of various indicators in predicting literacy proficiencies among the populations of interest. In addition, there would be no way to obtain evidence that these indicators remained valid over time.

In general, then, it seems that the strongest associations between census-type variables and literacy proficiencies can be expected for large heterogeneous populations where the primary question being asked concerns the number of people in one category or another. The dangers lie in expectations that the same degree of association will hold for various subpopulations if only a small set of variables is used. Problems also exist in more complex systems such as ones designed to indicate the overall health of an educational system. Dangers lie in assuming that the degree of association, once estimated, will remain constant over time. One major role for an indicator system, moreover, is to function as a complex hydraulic system in which it is possible to trace interactions between indicators and to track effects across the system of a change in one or more parts of the system. Small sets of proxy variables will probably not be very useful in this instance.

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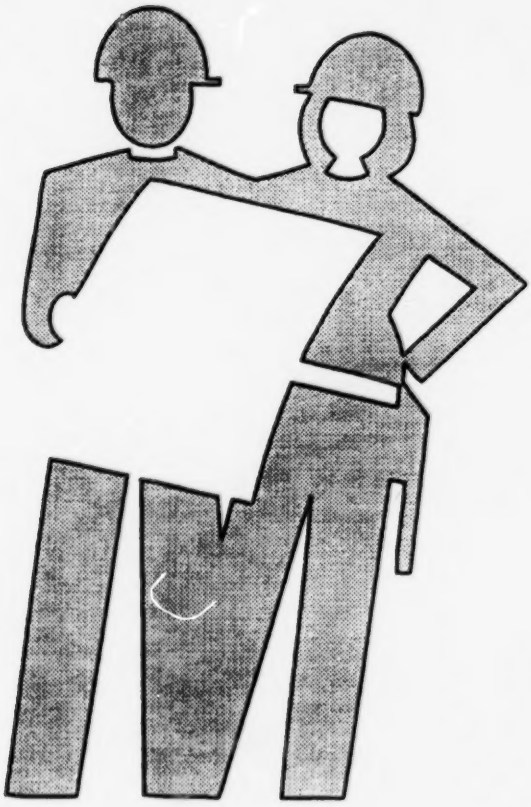
APPENDIX A

Workplace Literacy Background and Activity Questionnaire A–iii

Workplace Literacy



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Background Questionnaire

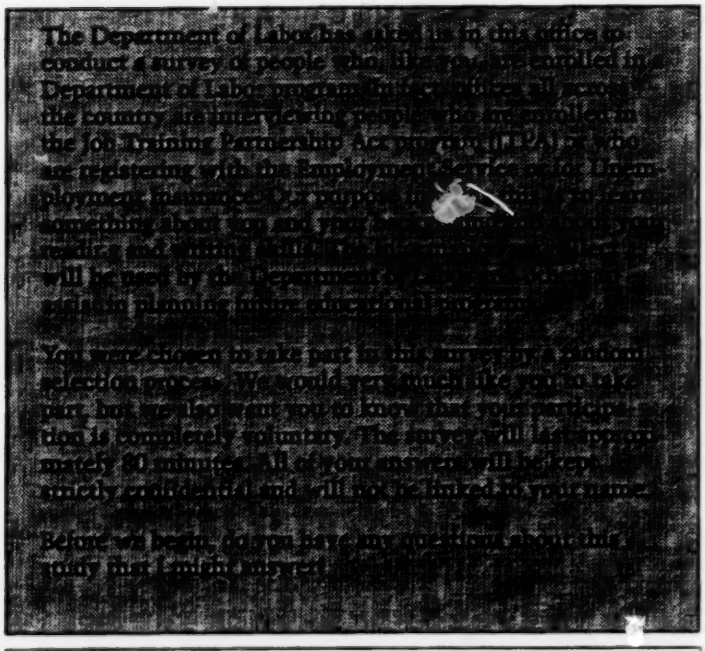
LOCATION NUMBER: _____

PROGRAM (JTPA, ES, UI, OR BOTH ES & UI): _____

RESPONDENT NUMBER: _____

TIME INTERVIEW BEGAN: _____

BACKGROUND AND ACTIVITY QUESTIONNAIRE



Pause to give respondent a chance to ask questions.

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First, I would like to ask you a few questions about yourself and when you were growing up.

1. In what country were you born?

1 USA
2 Other (specify country):_____
— Go to question 3

If USA, ask questions 2 and 2a and then go to question 6:

2. In what state or territory?

Record State or Territory:

_____

2a. In what county?

Record County: _____

If not born in USA (50 states or D.C.), ask:

3. How many years have you lived in the United States (50 states or D.C.)?

Record Number of Years: _____

4. Did you attend school before coming to the United States (50 states or D.C.)?

1 Yes
2 No — *Go to question 6*

If "Yes," ask:

5. What was the highest grade in school you completed before coming to the United States (50 states or D.C.)? (*Do not read list.*)

1 Primary (Grades K-3)
2 Elementary (Grades 4-8)
3 Secondary (Grades 9-12)
4 Vocational (Post-Secondary)
5 College/University

ASK EVERYONE

6. When you were growing up, what language or languages were *usually* spoken in your home? (*Circle all that apply.*)

1 English — *Go to question 11*
2 Spanish
3 Other (specify) _____

If "Spanish or other," ask:

7. Who in the household usually spoke in the language (languages) other than English? (*Do not read list. Circle all that apply.*)

1 Father (stepfather or male guardian)
2 Mother (stepmother or female guardian)
3 Brothers or sisters
4 Relatives (grandparents, aunts, uncles, etc.)
5 Non-relatives
6 Respondent

8. What language or languages do you speak most often now? (*Circle all that apply.*)

1 English
2 Spanish
3 Other (specify) _____

Interviewer: *If English only in question 8, go to question 11. Questions 9 and 10 refer to respondent's single or main non-English language. If only one non-English language in question 8, refer to that language. If more than one non-English language, ask respondent which is his or her main non-English language. Record single or main non-English language:* _____

*If **any non-English** language mentioned, ask:*

☞ **HAND RESPONDENT CARD A.**

9. How often do you currently speak that language?

1 Daily
2 Once or twice a week
3 Once or twice a month
4 Once or twice a year
5 Never

Go to question 11

*If language is used **daily or weekly**, ask:*

☞ **HAND RESPONDENT CARD B.**

10. What language do you use in each of the following situations?

	Almost always English	English more than other language	Other language more than English	Almost always other language	Other language only
a. At home	1	2	3	4	5
b. At work	1	2	3	4	5
c. While shopping in your neighborhood	1	2	3	4	5
d. When visiting friends or relatives	1	2	3	4	5

ASK EVERYONE

Now I would like to ask you some questions about your education.

11. Are you currently enrolled in school or taking any classes?

1 Yes
2 No — *Go to question 15*

If "Yes," ask:

12. Are you currently taking a GED class?

1 Yes
2 No

13. Are you considered to be a full-time or part-time student?

1 Full-time student
2 Part-time student

***Interviewer**: If respondent has a question about the definition of full time or part time, tell him or her to use the school's definition.*

14. What diplomas, certificates, degrees, or licenses do you expect to earn in school?

1 High school diploma or equivalency
2 Vocational, trade, or business
3 Two years of college (associate's degree)
4 Four- or five-year college degree (B.S., B.A.)
5 Master's, Ph.D., M.D., or other advanced degree
6 Other (specify): _____
7 None

Comments: _____

ASK EVERYONE

15. What was the last grade of public or private school you have completed? (*Do not read list.*)

1 Less than high school (0-8 years)
2 Some high school (9-12 but did not complete 12th grade)
3 High school graduate (12 years, accelerated or early graduate program)
4 Attended a vocational, trade, or business school after high school
5 College: less than two years
6 College: associate's degree (A.A.)
7 College: two years or more, no degree
8 College graduate (B.S. or B.A.)
9 Postgraduate/no degree
10 Postgraduate/degree (M.S., M.A., Ph.D., M.D., etc.)
11 Don't know

16. Did you receive a high school diploma?

1 Yes
2 No — *Go to question 19*

If "Yes," ask questions 17 and 18:

17. When did you receive the diploma?

Record year: _____

18. How would you classify the primary emphasis of your high school courses? (*Read list.*)

1 General only
2 Vocational, technical, or trade
3 College preparatory

After question 18, go to question 23.

19. What were the main reasons you stopped your schooling when you did?

_____

_____

_____

_____

20. Have you ever participated in an Adult Basic Education program?

1 Yes
2 No

Check question 12. If answered "Yes," go to question 23. If answered "No," ask:

21. Have you ever studied for a GED or high school equivalency certificate?

1 Yes
2 No — *Go to question 23*

If "Yes," ask:

22. Did you receive that certificate?

1 Yes
2 No — *Go to question 23*

22a. If "yes," when did you receive it?

Record year: _____

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ASK EVERYONE

23. Have you ever taken part in any of the following types of programs since leaving high school? (*Read list. Circle all that apply.*)

1 Vocational, technical, or secretarial program given by a public or private institution
2 Apprenticeship program
3 Employer-provided, work-site training program
4 Vocational, technical, or secretarial program provided by the military

*For **each item circled**, ask:*

24. How long were you in that program? (*Specify number of weeks.*)

1 _____ 2 _____ 3 _____ 4 _____

25. Did you serve in the military?

1 Yes
2 No — *Go to question 27*

If "Yes," ask:

26. In what branch of the armed forces did you serve?

Record branch: _____

26a. For how long did you serve?

Record years: _____

ASK EVERYONE

Now, I'd like to ask you some questions about your family when you were growing up.

27. What was the highest grade your mother (stepmother or femaleguardian) completed in school? (*Do not read categories.*)

1 Less than high school (0-8 years)
2 Some high school (9-12 but did not complete 12th grade)
3 High school graduate (12 years, accelerated or early graduate program)
4 Attended a vocational, trade, or business school after high school
5 College: less than two years
6 College: associate's degree (A.A.)
7 College: two years or more, no degree
8 College graduate (B.S. or B.A.)
9 Postgraduate/no degree
10 Postgraduate/degree (M.S., M.A., Ph.D., M.D., etc.)
11 Don't know

28. What was the highest grade your father (stepfather or male guardian) completed in school? (*Do not read categories.*)

1 Less than high school (0-8 years)
2 Some high school (9-12 but did not complete 12th grade)
3 High school graduate (12 years, accelerated or early graduate program)
4 Attended a vocational, trade, or business school after high school
5 College: less than two years
6 College: associate's degree (A.A.)
7 College: two years or more, no degree
8 College graduate (B.S. or B.A.)
9 Postgraduate/no degree
10 Postgraduate/degree (M.S., M.A., Ph.D., M.D., etc.)
11 Don't know

29. Which of the following materials (written in English) did you have in your home while you were in high school? (*Read list.*)

***Interviewer**: If respondent did not attend high school, ask him or her to answer according to the age when he or she would have been in high school, ages 15-18.*

	Yes	No	Don't know
A daily or weekly newspaper	1	2	X
Magazines	1	2	X
More than 25 books in the home	1	2	X
An encyclopedia	1	2	X
A dictionary	1	2	X
A personal computer (that is, something with a keyboard and a screen)	1	2	X

Now, I'd like to ask you some questions about your everyday life.

30. Are you currently registered to vote?

1 Yes — *Go to question 32*
2 No

*If **not registered**, ask:*

31. Are you eligible to register to vote in the United States?

1 Yes
2 No

ASK EVERYONE

32. Have you ever voted in a public election in the United States?

1 Yes
2 No

Interviewer, say to respondent: "Some people seem to follow what's going on in government and public affairs most of the time, whether there's an election going on or not. Others aren't that interested."

33. Would you say you follow what's going on in government and public affairs most of the time, some of the time, only now and then, or hardly at all?

1 Most of the time
2 Some of the time
3 Only now and then
4 Hardly at all

34. How many hours do you usually spend watching television each day?

1 None
2 1 hour or less
3 2 hours
4 3 hours
5 4 hours
6 5 hours
7 6 or more hours

Now, I'd like to ask you some questions about your main occupation during the past 12 months.

35. Did you do any work for pay or profit last week (including pay from self-employment)?

1 Yes
2 No — *Go to question 38*

If "Yes," ask questions 36 and 37:

36. How many hours did you work last week?

Hours: _____

37. What was your hourly wage (including tips and commissions) *before* any deductions?

Hourly wage: _____

Interviewer: *For questions 37 and 44, if the respondent can not provide an hourly wage, then ask for a weekly, monthly, or yearly wage and indicate which wage it is.*

After question 37, go to question 40.

38. What were you doing last week (what was your status)?

1 Unemployed or laid off
2 In school or training
3 Keeping house
4 Other (specify)

Go to question 40

_____

*If **unemployed or laid off**, ask:*

39. Were you looking for work?

1 Yes
2 No

ASK EVERYONE

40. During the past 12 months how many weeks did you work for pay or wages (including weeks of paid vacation)?

Record weeks: _____

*If **52 weeks** for question 40, ask question 41 and then go to question 43:*

41. How many consecutive years have you been working in that job; that is, either for that employer or in that line of work?

Record years: _____

*If **less than 52 weeks** for question 40, ask:*

42. Of the weeks you were not employed, what were you doing?

1 Looking for work
2 In school or training
3 Keeping house
4 Other (specify) _____

*If **0 weeks** for question 40, go to question 45.*
*If **any other number of weeks** for question 40, ask:*

43. On average, how many hours per week did you work?

Record hours: _____

44. What was your hourly wage (including tips and commissions) before any deductions?

Record hourly wage: _____

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ASK EVERYONE

45. Did you work more than 20 hours a week while you were going to high school?

1 Yes, year round
2 Yes, summers only
3 Yes, during the school year only
4 No
5 Did not attend high school

Go to question 47

If "Yes" on question 45, ask:

46. For how long did you hold that job?

Record length of time: _____

ASK EVERYONE

47. How old were you when you held your first full-time job after leaving school?

1 Record age: _____
2 Never worked full-time — *Go to question 57*

If age recorded for question 47, ask:

48. What kind of work did you do in your first full-time job, that is, what was your main job called?

Record occupation: _____

49. In your most recent occupation, what kind of work did you do, that is, what was your main job called?

Record occupation: _____

49a. How many years did you work in this occupation?

Record years: _____

☞ HAND RESPONDENT CARD C.

50. How often did you read and/or use information from each of the following on your job?

	Every day	A few times a week	Once a week	Less than once a week	Never
a. Reports or journal articles	1	2	3	4	5
b. Forms	1	2	3	4	5
c. Letters	1	2	3	4	5
d. Diagrams or schematics	1	2	3	4	5

51. How often did you have to write up or fill out each of the following for your job? (*Use Card C.*)

	Every day	A few times a week	Once a week	Less than once a week	Never
a. Memos, business letters	1	2	3	4	5
b. Reports	1	2	3	4	5
c. Forms	1	2	3	4	5
d. Bills, invoices	1	2	3	4	5

52. How often did you have to use mathematics for your job—every day, a few times a week, once a week, less than once a week, never?

1 Every day
2 A few times a week
3 Once a week
4 Less than once a week
5 Never

53. Did you feel your reading skills were good enough for your job?

1 Yes
2 No
3 Don't know

54. Did you feel your writing skills were good enough for your job?

1 Yes
2 No
3 Don't know

55. Did you feel your mathematics skills were good enough for your job?

1 Yes
2 No
3 Don't know

HAND RESPONDENT CARD D.

56. Considering all aspects of your most recent job, rate each of the following skills and abilities on a scale of one to five according to their importance in performing your job effectively.

	Not important at all	Somewhat important	Important	Very important	Extremely important
a. Reading	1	2	3	4	5
b. Writing	1	2	3	4	5
c. Working with numbers (mathematics)	1	2	3	4	5
d. Talking clearly to others	1	2	3	4	5
e. Listening well to others	1	2	3	4	5
f. Solving problems you encounter on the job	1	2	3	4	5
g. Coming up with new ideas for your work	1	2	3	4	5
h. Working well with others	1	2	3	4	5
i. Planning the future of your career	1	2	3	4	5
j. Organizing your activities on the job	1	2	3	4	5
k. Leading others on the job	1	2	3	4	5

ASK EVERYONE

57. Do you think you could get a (better) job if you received additional training in reading or writing English?

1 Yes
2 No

58. Do you think you could get a (better) job if you received additional training in mathematics?

1 Yes
2 No

HAND RESPONDENT CARD E.

59. How frequently do family members or friends help you with. . . ? (*Read activities.*)

	Daily	Weekly	Every month	Once or twice a year	Never
a. Filling out forms	1	2	3	4	5
b. Reading/explaining newspaper articles or other written information	1	2	3	4	5
c. Dealing with government agencies, public companies, business, medical personnel, etc.	1	2	3	4	5
d. Writing notes and letters	1	2	3	4	5

HAND RESPONDENT CARD F.

60. Do you currently have any of these conditions? (*Circle all that apply.*)

1 Learning disability
2 Eye trouble (not corrected by glasses)
3 Hearing problem/deafness
4 Speech disability
5 Physical disability
6 Long-term illness (6 months or more)
7 No illness or disability

I would now like to ask you about those in your current household.

61. What is your current marital status?

1 Single and never married
2 Married (living with spouse)
3 Married (spouse temporarily living elsewhere)
4 Legally separated or divorced
5 Widowed

62. Who currently lives in your household with you? (*Do not read list. Circle all that apply.*)

1 Father (stepfather or male guardian)
2 Mother (stepmother or female guardian)
3 Brother(s) or sister(s)
4 Wife/husband
5 Children (other than respondent's brother/sister)
6 Other adult relatives (grandparents, aunts, uncles, etc.)
7 Non-relatives
8 Live alone — *Go to question 64*

Interviewer: *Probe by asking,* "With whom are you currently living?"

If circled ***3*** *or* ***5****, ask question 62a:*

62a. How many brothers or sisters or children are under the age of 5?

Record number: _____

63. How many people live in your household including yourself?

Number: _____

64. What are the city, state, and zip code of your current address?

City or town: _____

State and zip code: _____

64a. How long have your lived at this address?

Record years: _____

65. How many people in your household are employed or work for pay or wages. . .

Full-time? _____

Part-time? _____

☞ **HAND RESPONDENT CARD G.**

66. What is your estimate of your *personal* income from all sources for the past 12 months?

1 Under $5,000
2 $ 5,000 - $ 9,999
3 $10,000 - $14,999
4 $15,000 - $19,999
5 $20,000 - $29,999
6 $30,000 - $39,999
7 $40,000 - $49,999
8 $50,000 and over
9 Refused
10 Don't know
11 No personal income

67. What is your estimate of your total *household* income from all sources for the past 12 months? *(Use Card G.)*

1 Under $5,000
2 $ 5,000 - $ 9,999
3 $10,000 - $14,999
4 $15,000 - $19,999
5 $20,000 - $29,999
6 $30,000 - $39,999
7 $40,000 - $49,999
8 $50,000 and over
9 Refused
10 Don't know

68. Did you or anyone in your household receive any of the following during the past 12 months? (*Read list. Circle all that apply.*)

1 AFDC (aid to families with dependent children)
2 General assistance, home relief
3 SSI (supplemental security income)
4 Food stamps
5 Unemployment compensation
6 Other (public/private source, for example church, not family) _____

Now, I'd like to talk to you about what you read in English.

69. How often do you read a newspaper in English — every day, a few times a week, once a week, less than once a week, or never?

1 Every day
2 A few times a week
3 Once a week
4 Less than once a week
5 Never — *Go to question 72*

If ***ever read a newspaper****, ask:*

70. Is reading the newspaper part of your job or school work?

1 Yes
2 No

☞ **HAND RESPONDENT CARD H.**

71. **This is a list of different parts of newspapers. Would you please tell me which parts you generally read when looking at a newspaper? (*Circle all that apply.*)**

1 National/international news
2 State/local news
3 Sports
4 Women's/society pages
5 Editorial page
6 Financial news or stock listings
7 Comics
8 Classified ads
9 Other advertisements
10 TV listings
11 Movie or concert listings
12 Book, movie, or art reviews
13 Horoscope
14 Other: _____

_____

Probe: Do you read any *other* parts of the newspaper? (*Record above, under "14 other."*)

ASK EVERYONE

☞ **HAND RESPONDENT CARD I.**

72. **Which of the groups on this card best describes you? (*If respondent refuses to answer, please record from observation the respondent's race/ethnicity.*)**

1 White
2 Black
3 American Indian, Alaskan Native
4 Asian, Pacific Islander
5 Other (specify): _____

73. **Are you of Spanish or Hispanic origin or descent?**

1 Yes
2 No — *Go to question 75*

If Hispanic, ask:

☞ **HAND RESPONDENT CARD J.**

74. **Which of these descriptions best describes your Hispanic origin?**

1 Mexican/Mexican-American, Chicano
2 Puerto Rican
3 Cuban
4 Central/South American
5 Other Spanish/Hispanic

ASK EVERYONE

75. **When were you born?**

Record month: _____ Year: _____

76. **What is your social security number?**

Interviewer: *Say to respondent:* "Providing your social security number is voluntary. Please note, however, that it will be deleted from the permanent record."

Record number: _____

If respondent is part of the JTPA or ES population, ask:

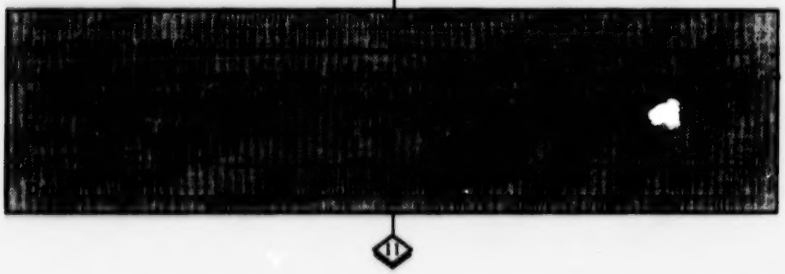
77. **What benefit or benefits do you expect to gain from _____? (*Fill in JTPA or ES.*)**

_____

_____

☞ **INTERVIEWER: PLEASE NOTE.**

78. **Sex:** ☐ Male ☐ Female



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APPENDIX B

Scheme for the Coding of Background and Attitude Variables Used in Regression Analyses B–iii

Scheme for the Coding of Background and Attitude Variables Used in Regression Analyses

Gender

0 Male
1 Female

Ethnicity 1

1 White
0 Black and Hispanic

Ethnicity 2

1 Hispanic
0 White and Black

Parental Education

Highest Education used, Questions 27 & 28
1 Less than high school
2 Some high school
3 High school graduate, vocational school after high school, less than two years of college, two years or more of college/no degree, I don't know, missing
4 A.A. degree, college graduate, postgraduate/no degree, postgraduate/degree

Respondent's Education

Questions 15 & 22 (GED)
1 Less than high school
2 Some high school
3 High school graduate, vocational school after high school, less than two years of college, two years or more of college/no degree, I don't know, missing, GED
4 A.A. degree, college graduate, postgraduate/no degree, postgraduate/degree

High School Curriculum

Question 18
1 College preparatory
0 All others (1, 2 and missing)

Materials in the Home

Question 29, Sum of reading materials in the home
0 No reading materials
1 One piece
2 Two pieces
3 Three pieces
4 Four pieces
5 Five pieces
6 Six pieces

Overall Newspaper Reading

Question 71, Number of parts read
0-13 Sum of parts

TV Watching

Question 34, Hours spent watching TV each day
1 None
2 1 hour or less

3 2 hours
4 3 hours and missing
5 4 hours
6 5 hours
7 6 or more hours

Voting

Question 32, voted in public election
0 Yes
1 No and Missing

Positive statement about employment
1 employed (Q 35), in school or keeping house (Q 38)
0 Q 35 equal 2, or Q 38 equal 1, 4 or missing

Poverty Status

Poverty/Near poverty status
0 Not poor, Q 67 equals 6,7 or 8
1 poor or near poor , Q 63 and Q 67
household size equals 1 or 2, and income < 9,999
household size equals 3 or 4, and income <14,999
household size equals 5 or 6, and income <19,999
household size equals 7,8, 9, or 10 or 4, and income <29,999

Reading Practice 1

Q 69 equals 1, 2, or 3 and Q 71 parts marked yes
1 Reads English newspaper at least once a week, sections - national, state, editorial, or financial
0 Other

Reading Practice 2

Q 69 equals 1, 2, or 3 and Q 71 parts marked yes
1 Reads English newspaper at least once a week, sections - sports
0 Other

Reading Practice 3

Q 69 equals 1, 2, or 3 and Q 71 parts marked yes
1 Reads English newspaper at least once a week, sections - society/women, TV, book review, or horoscope
0 Other

Reading Practice 4

Q 69 equals 1, 2, or 3 and Q 71 parts marked yes
1 Reads English newspaper at least once a week, sections - movies, TV, advertisement, or classifieds
0 Other

Occupation

Question 49, Most recent employment
1 Laborer Code 51
2 Service Codes 46-50
3 Operative Codes 33-34
4 Clerical Codes 21-32
5 Crafts Codes 36-45
6 Sales Codes 18-20

7 Technical Codes 3, 10 - 11, and 15
8 Professional Codes 4-9, 12-14, and 16-17

Weeks Worked

Question 40
0-52 weeks missing and greater than 52 equals blank

Hours Worked

Annual hours worked, Q 40 weeks * Q 43 hours weeks equal 0-52 and hours equal 0-80 (log)

Hourly Wage

Question 44
Hourly wage if employed, see number 14 (log)

Years in USA

Q 3, If foreign born, if born in the USA or missing
Q 3, then actual age

Frequency of Reading

Q 50, Sum of a,b,c, and d reversed, 1 = never.

Frequency of Writing

Q 51, Sum of a,b,c, and d reversed, 1 = never

Frequency of Math

Q 52, Mathematics on the job
1 Never
2 Less than once a week
3 Once a week
4 A few times a week
5 Every day

Household Income

Q 67
1 <5000
2 $5000-$9999
3 $10000 - $14999
4 $15000 - $19999
5 $20000 - $29999
6 $30000 - $39999
7 $40000 - $49999
8 $50000+
blank Missing data, refused, or I don't know

Public Affairs

Q 33, Follow what's going on - Reversed
1 Hardly at all
2 Only now and then
3 Some of the time
4 Most of the time

Adequacy of Reading for Current or Most Recent Job Q 53
0 No, I don't know
1 Yes

Adequacy of Writing Skills for a Job Q 54

0 No, don't know
1 Yes

Adequacy of Math Skills for a Job Q 55

0 No, don't know
1 Yes

Improved Reading and Writing Lead to a Better Job Q 57

0 No
1 Yes

Improved Math Leads to a Better Job Q 58

0 No
1 Yes

APPENDIX C: TABLES AND FIGURE

Table 1 *Comparisons of Standardized Regression Weights Across Three Literacy Scales and Four Adult Populations* C–iii

Table 2 *Comparisons Among Multiple Correlations Using Census-Type and Other Background Variables With Demonstrated Literacy Proficiencies* C–iv

Figure 1 *Six General Areas of Variables* C–v

Table 1

Comparisons of Standardized Regression Weights Across Three Literacy Scales and Four Adult Populations

	ES/LI			JTPA			OREGON			MISSISSIPPI		
	P	D	Q	P	D	Q	P	D	Q	P	D	Q
Demographics												
Gender	.06	.05	.01	.15	.07	.06	.07	.01	.00	.08	-.01	.03
Ethnicity 1	.34	.41	.41	.22	.32	.31	.09	.06	.09	.43	.46	.50
Ethnicity 2	.03	.04	.05	.01	.00	.03	-.09	-.10	-.04	.04	.07	.08
Parental education	.22	.23	.22	.12	.15	.15	.25	.24	.20	.15	.17	.16
Years in USA	.16	.11	.09	.11	.02	.11	.00	-.06	.05	-.32	-.35	-.26
Educational/Home Support												
Materials in home	.12	.20	.13	.20	.18	.21	.10	.15	.13	.26	.29	.22
High school curriculum	.26	.25	.26	.35	.24	.29	.24	.28	.24	.21	.23	.19
Respondent's education level	.39	.33	.38	.46	.47	.46	.46	.46	.40	.47	.46	.41
Economy/Labor Market												
Occupation	.19	.23	.22	.22	.20	.25	.26	.28	.23	.14	.12	.13
Poverty	.10	.15	.10	.10	.01	.05	.16	.18	.18	.14	.15	.16
Hours worked per year	.06	.08	.06	.11	.14	.08	.12	.14	.14	.11	.14	.10
Weeks worked	.10	.12	.11	.21	.18	.15	.18	.15	.19	.21	.22	.18
Hourly wage	.25	.28	.24	.27	.09	.14	.22	.25	.23	.34	.35	.28
Household income	.22	.28	.23	.22	.16	.22	.28	.29	.28	.34	.36	.36
Practices/Activities												
Overall newspaper reading	.16	.15	.13	.22	.31	.27	.15	.14	.12	.20	.23	.18
Practice 1: news, edit., finan.	.18	.16	.13	.20	.25	.23	.18	.17	.16	.21	.22	.20
Practice 2: sports	.04	.03	.03	-.05	.04	.07	.11	.10	.06	.11	.09	.08
Practice 3: women's review	.10	.07	.02	.12	.14	.15	.05	.06	.02	.16	.16	.13
Practice 4: classified	.09	.06	.02	.10	.16	.12	.03	.05	.02	.13	.16	.12
TV watching	.07	.06	.12	-.13	-.10	-.12	.19	.18	.20	.09	.08	.12
Frequency of reading for a job	.13	.18	.12	.06	.03	.02	.12	.16	.14	.15	.17	.12
Frequency of writing for a job	.14	.16	.12	.06	.01	.00	.08	.10	.09	.13	.14	.10
Frequency of math for a job	.15	.17	.19	.08	.14	.15	.11	.09	.15	.20	.23	.18
Citizenship												
Voting	.21	.11	.17	.19	.17	.21	.16	.18	.21	.18	.15	.13
Keeping abreast	.15	.12	.09	.14	.18	.16	.12	.11	.11	.15	.18	.13
Self Evaluation/Attitude												
Adequacy of reading skills for a job	.19	.19	.16	.21	.22	.18	.08	.14	.07	.19	.14	.11
Adequacy of writing skills for a job	.15	.17	.17	.20	.22	.22	.09	.13	.08	.15	.14	.10
Adequacy of math skills for a job	.17	.18	.19	.13	.14	.19	.09	.09	.11	.17	.14	.14
Improved reading/writing skills leads to a better job	.24	.27	.26	.33	.29	.25	.22	.24	.25	.20	.19	.19
Improved math skills leads to a better job	.12	.15	.18	.14	.17	.20	.16	.16	.19	.16	.15	.15

Note: P = prose
D = document
Q = quantitative

Table 2

Comparisons Among Multiple Correlations Using Census-Type and Other Background Variables With Demonstrated Literacy Proficiencies

	JTPA			ES/UI			OREGON			MISSISSIPPI		
	P	D	Q	P	D	Q	P	D	Q	P	D	Q
Census only	.57	.58	.60	.66	.64	.64	.57	.57	.49	.72	.77	.74
Idiosyncratic	.71	.68	.69	.72	.70	.70	.59	.60	.53	.74	.80	.75
Census plus	.68	.64	.65	.70	.68	.67	.58	.59	.52	.73	.78	.74

Note: P = prose
D = document
Q = quantitative

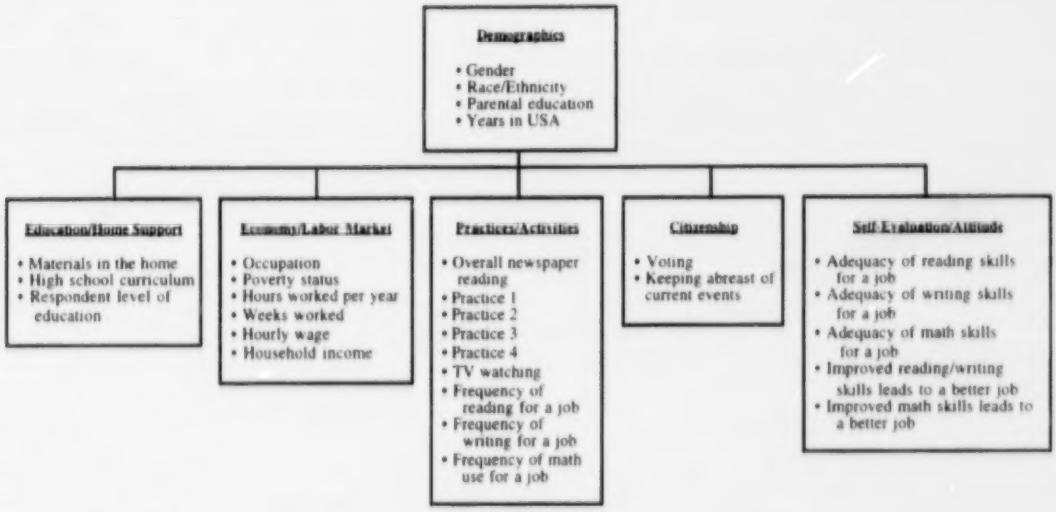
Demographics
• Gender
• Race/Ethnicity
• Parental education
• Years in USA
Education/Home Support
• Materials in the home
• High school curriculum
• Respondent level of education
Economy/Labor Market
• Occupation
• Poverty status
• Hours worked per year
• Weeks worked
• Hourly wage
• Household income
Practices/Activities
• Overall newspaper reading
• Practice 1
• Practice 2
• Practice 3
• Practice 4
• TV watching
• Frequency of reading for a job
• Frequency of writing for a job
• Frequency of math use for a job
Citizenship
• Voting
• Keeping abreast of current events
Self-Evaluation/Attitude
• Adequacy of reading skills for a job
• Adequacy of writing skills for a job
• Adequacy of math skills for a job
• Improved reading/writing skills leads to a better job
• Improved math skills leads to a better job

Figure 1. Six general areas of variables shown to be important to literacy performance in the ETS surveys.